

§ 230.113

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Weight per axle (weight on drivers divided by number of pairs of driving wheels)	Diameter of wheel center (inches)	Minimum thickness (inches)
Over 30,000 to 35,000 pounds .....	Over 74 .....	1 <sup>5</sup> / <sub>8</sub>
	44 and under .....	1 <sup>5</sup> / <sub>16</sub>
	Over 44 to 50 .....	1 <sup>3</sup> / <sub>8</sub>
	Over 50 to 56 .....	1 <sup>7</sup> / <sub>16</sub>
	Over 56 to 62 .....	1 <sup>1</sup> / <sub>2</sub>
	Over 62 to 68 .....	1 <sup>9</sup> / <sub>16</sub>
	Over 68 to 74 .....	1 <sup>3</sup> / <sub>8</sub>
Over 35,000 to 40,000 pounds .....	Over 74 .....	1 <sup>11</sup> / <sub>16</sub>
	44 and under .....	1 <sup>3</sup> / <sub>8</sub>
	Over 44 to 50 .....	1 <sup>7</sup> / <sub>16</sub>
	Over 50 to 56 .....	1 <sup>1</sup> / <sub>2</sub>
	Over 56 to 62 .....	1 <sup>9</sup> / <sub>16</sub>
	Over 62 to 68 .....	1 <sup>3</sup> / <sub>8</sub>
	Over 68 to 74 .....	1 <sup>11</sup> / <sub>16</sub>
Over 40,000 to 45,000 pounds .....	Over 74 .....	1 <sup>3</sup> / <sub>4</sub>
	44 and under .....	1 <sup>7</sup> / <sub>16</sub>
	Over 44 to 50 .....	1 <sup>1</sup> / <sub>2</sub>
	Over 50 to 56 .....	1 <sup>9</sup> / <sub>16</sub>
	Over 56 to 62 .....	1 <sup>3</sup> / <sub>8</sub>
	Over 62 to 68 .....	1 <sup>11</sup> / <sub>16</sub>
	Over 68 to 74 .....	1 <sup>3</sup> / <sub>4</sub>
Over 45,000 to 50,000 pounds .....	Over 74 .....	1 <sup>13</sup> / <sub>16</sub>
	44 and under .....	1 <sup>1</sup> / <sub>2</sub>
	Over 44 to 50 .....	1 <sup>9</sup> / <sub>16</sub>
	Over 50 to 56 .....	1 <sup>3</sup> / <sub>8</sub>
	Over 56 to 62 .....	1 <sup>11</sup> / <sub>16</sub>
	Over 62 to 68 .....	1 <sup>3</sup> / <sub>4</sub>
	Over 68 to 74 .....	1 <sup>13</sup> / <sub>16</sub>
Over 50,000 to 55,000 pounds .....	Over 74 .....	1 <sup>7</sup> / <sub>8</sub>
	44 and under .....	1 <sup>9</sup> / <sub>16</sub>
	Over 44 to 50 .....	1 <sup>3</sup> / <sub>8</sub>
	Over 50 to 56 .....	1 <sup>11</sup> / <sub>16</sub>
	Over 56 to 62 .....	1 <sup>3</sup> / <sub>4</sub>
	Over 62 to 68 .....	1 <sup>13</sup> / <sub>16</sub>
	Over 68 to 74 .....	1 <sup>7</sup> / <sub>8</sub>
Over 55,000 pounds .....	Over 74 .....	1 <sup>15</sup> / <sub>16</sub>
	44 and under .....	1 <sup>3</sup> / <sub>8</sub>
	Over 44 to 50 .....	1 <sup>11</sup> / <sub>16</sub>
	Over 50 to 56 .....	1 <sup>3</sup> / <sub>4</sub>
	Over 56 to 62 .....	1 <sup>13</sup> / <sub>16</sub>
	Over 62 to 68 .....	1 <sup>7</sup> / <sub>8</sub>
	Over 68 to 74 .....	1 <sup>15</sup> / <sub>16</sub>
Over 74 .....	2	

(e) *Tire width.* Flanged tires shall be no less than 5½ inches wide for standard gage and no less than 5 inches wide for narrow gage. Plain tires shall be no less than 6 inches wide for standard gage and no less than 5½ inches wide for narrow gage.

§ 230.113 **Wheels and tire defects.**

Steam locomotive and tender wheels or tires developing any of the defects listed in this section shall be removed from service immediately and repaired. Except as provided in § 230.114, welding on wheels and tires is prohibited. A wheel that has been welded is a welded wheel for the life of the wheel.

(a) *Cracks or breaks.* Wheels and tires may not have a crack or break in the

flange, tread, rim, plate, hub or brackets.

(b) *Flat spots.* Wheels and tires may not have a single flat spot that is 2½ inches or more in length, or two adjoining spots that are each two or more inches in length.

(c) *Chipped flange.* Wheels and tires may not have a gouge or chip in the flange that is more than 1½ inches in length and ½ inch in width.

(d) *Broken rims.* Wheels and tires may not have a circumferentially broken rim if the tread, measured from the flange at a point ⅝ inch above the tread, is less than 3¾ inches in width.

(e) *Shelled-out spots.* Wheels and tires may not have a shelled-out spot 2½ inches or more in length, or two adjoining spots that are each two or more

inches in length, or so numerous as to endanger the safety of the wheel.

(f) *Seams.* Wheels and tires may not have a seam running lengthwise that is within  $3\frac{3}{4}$  inches of the flange.

(g) *Worn flanges.* Wheels and tires may not have a flange worn to a  $\frac{15}{16}$  inch thickness or less, as measured at a point  $\frac{3}{8}$  inch above the tread.

(h) *Worn treads.* Wheels and tires may not have a tread worn hollow  $\frac{5}{16}$  inch or more.

(i) *Flange height.* Wheels and tires may not have a flange height of less than 1 inch nor more than  $1\frac{1}{2}$  inches, as measured from the tread to the top of the flange.

(j) *Rim thickness.* Wheels may not have rims less than 1 inch thick.

(k) *Wheel diameter.* Wheels may not have wheel diameter variance, for wheels on the same axle or in the same driving wheel base, greater than  $\frac{3}{32}$  inch, when all tires are turned or new tires applied to driving and trailing wheels. When a single tire is applied, the diameter must not vary more than  $\frac{3}{32}$  inch from that of the opposite wheel on the same axle. When a single pair of tires is applied the diameter must be within  $\frac{3}{32}$  inch of the average diameter of the wheels in the driving wheel base to which they are applied.

#### § 230.114 Wheel centers.

(a) *Filling blocks and shims.* Driving and trailing wheel centers with divided rims shall be properly fitted with iron or steel filling blocks before the tires are applied, and such filling blocks shall be properly maintained. When shims are inserted between the tire and the wheel center, not more than two thicknesses of shims may be used, one of which must extend entirely around the wheel. The shim which extends entirely around the wheel may be in three or four pieces, providing they do not lap.

(b) *Wheel center condemning defects.* Wheel centers with any of the following defects shall be removed from service immediately and repaired:

- (1) Wheels centers loose on axle;
- (2) Broken or defective tire fastenings;
- (3) Broken or cracked hubs, plates, bolts or spokes, except as provided in paragraph (b)(4) of this section; or

(4) Driving or trailing wheel center with three adjacent spokes or 25 percent or more of the spokes in the wheel broken.

(c) *Wheel center repairs.* Wheel centers may be repaired by welding or brazing provided that the defect can properly be so repaired and, following the repair, the crankpin and axle shall remain tight in the wheel. Banding of the hub is permitted.

(d) *Counterbalance maintenance.* Wheel counterbalances shall be maintained in a safe and suitable condition for service.

#### STEAM LOCOMOTIVE TANKS

##### § 230.115 Feed water tanks.

(a) *General provisions.* Tanks shall be maintained free from leaks, and in safe and suitable condition for service. Suitable screens must be provided for tank wells or tank hose and shall be maintained in a manner that allows the unobstructed flow of water. Feed water tanks shall be equipped with a device that permits the measurement of the quantity of water in the tender feed water tank from the cab or tender deck of the steam locomotive. Such device shall be properly maintained.

(b) *Inspection frequency.* As often as conditions warrant but not less frequently than every 92 service days, the interior of the tank shall be inspected, and cleaned if necessary.

(c) *Top of tender.* Top of tender behind fuel space shall be kept clean, and means provided to carry off excess water. Suitable covers shall be provided for filling holes.

##### § 230.116 Oil tanks.

The oil tanks on oil burning steam locomotives shall be maintained free from leaks. The oil supply pipe shall be equipped with a safety cut-off device that:

- (a) Is located adjacent to the fuel supply tank or in another safe location;
- (b) Closes automatically when tripped and that can be reset without hazard; and
- (c) Can be hand operated from clearly marked locations, one inside the cab and one accessible from the ground on